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(54) **SHARP-PHASE CHANGE SHAPE MEMORY ALLOY THERMAL ACTUATOR**

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(57) **ABSTRACT**

A valve actuator, valve, and method of actuation of a valve are disclosed. The valve actuator includes a shape memory alloy element attachable to a valve body, capable of use with a valve to cause movement of the valve between first and second positions responsive to at least a threshold amount of temperature change of the shape memory alloy element. The valve actuator further includes a negative-differential spring applied to the shape memory alloy element, thereby reducing the threshold amount of temperature change needed to cause movement of the valve between the first and second positions.

15 Claims, 12 Drawing Sheets